THOMAS WALTER TYPIFICATION PROJECT, I. OBSERVATIONS ON THE JOHN FRASER FOLIO

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ABSTRACT

The Natural History Museum, London, is the repository of a large volume containing plants collected by John Fraser in the southeastern United States in the 1780s and commonly known as the "Walter Herbarium." The importance of this collection is that many of its specimens were seen and perhaps used by Thomas Walter, author of *Flora Caroliniana*, the first American flora to adopt Linnaean binomials and classification. A description is provided here of this folio and the collection it contains.

RESUMEN

El Natural History Museum de Londres, es el depositario de un gran volumen que contiene plantas colectadas por John Fraser en el sudeste de los Estados Unidos en los 1780s y conocido normalmente como el "Walter Herbarium." La importancia de esta colección radical en que muchos de sus especimenes fueros vistos y quizás usados por Thomas Walter, autor de la *Flora Caroliniana*, la primera flora americana en adoptar la clasificación Linneana y la nomenclatura binomial. Se hace una descripción de este volumen y la colección que contiene.

The Thomas Walter Typification Project is the term now given of an effort, extended intermittently over forty years, to bring understanding and nomenclatural precision to the many plant names published by Thomas Walter in his pioneer *Flora Caroliniana* (1788). Walter, an English rice-plantation owner and amateur but skilled botanist, resident of South Carolina, was the first to prepare a flora of American plants utilizing Linnaeus's binomial nomenclature and sexual system of classification. A brief but close relationship developed between Walter and John Fraser, a Scottish plant explorer who in the late 1780s gathered numerous specimens from the southeastern United States into a large folio herbarium now held by the Natural History Museum, London. The specimens of this herbarium were seen and may in part have been used by Walter in preparation of the diagnoses of his new species. The present report is an account of the physical characteristics of this historic collection.

The information of this report is derived from notes taken during a two-week examination of the folio by the present author in July 1984, and from 8x10 glossy photos enlarged from negatives made of the folio by Dr. Bernice G. Schubert in November and December 1946 (Fernald & Schubert 1948). (Commercial microfiches distributed in 1985 were of lesser clarity. Digital images prepared in 2005 were not yet available.) Though much remains unknown, many aspects of the interrelated lives and works of Thomas Walter and John Fraser have been documented by Britten (1921), Coker (1910), Hogg (1852), Maxon (1936), Rembert (1980), Simpson et al. (1997), Small (1935), and Ward (1962 1977).

The specimens are mounted on the pages of a large book, a folio, 54.5 cm tall, 38 cm wide, about 8 cm thick, bound in green cloth and half-leather with 5 transverse raised bands and several thin gold lines. The pages are 52 cm by 35.5 cm, of heavy linen-rag watermarked paper, bound permanently along a lateral margin. The book is of commer-

cial origin, manufactured in advance of its present use; it was not made by binding together separate sheets to which the plants had been attached. Two initial pages are unnumbered; each subsequent page has been numbered by hand near its upper margin. The folio consists of 119 numbered pages (not 117, as reported); two numbers (61 and 62) were used twice.

The frontispiece, the unnumbered first page of the folio, bears an attached sheet (right-diagonals indicate new lines; left diagonals reflect superscripted letters): "The Herbarium of Tho\s Walter Esq. of South Carolina. / Author of the Flora Caroliniana, pub. 1788 / Presented May 23, 1849, to the / Linnean Society of London, by John Fraser, / son of John Fraser, the indefatigable / North American Botanical Collector, / from the years 1786 to 1811. He died / in London, the latter year." This slip (as believed by James Britten 1921) is in the hand of Fraser's son, John Fraser fil. A second, unknown writer has restated these words by inscription onto the page itself: "The Herbarium / of Thomas Walter / author of the / "Flora Caroliniana." / Presented to the Linnean Society, 23 May 1849, / and purchased at the sale of the Society's / Surplus Collections in 1863 (for 15/.)." The frontispiece also bears a detailed listing (probably by Britten) of the persons, into the 20th century, whose annotations are to be found within the folio.

The title page of the folio, also unnumbered, bears the boldly written words, "Walter's Herbarium," the dates "1786–1788," and the initials, "J.F." The hand is that of John Fraser. The dates encompass the frenetic eighteen months—from September 1786 until March 1788—during which Fraser traveled and collected in the American Southeast.

The plants of the collection are mounted (counterintuitively) on the left-hand pages of the opened folio. The herbarium consists of 690 specimens (of which three are represented only by their labels and by stains on the page to which they had been attached). The specimens are mounted with as few as 1 and as many as 12 on a single page (an average of 5.8 specimens per page).

For clarity of reference in present and future study, images (xeroxes from photos) of the specimens have been enumerated by two-part designators: each individual specimen is given the number of the page on which it is mounted, followed by a capital letter. (The two pages with duplicated numbering, p. 61 and p. 62, are distinguished by suffixes "a" and "b.") The specimens, insofar as their arrangement on the page permits, have been assigned a designator in alphabetical order, from upper left to upper right, second-row left to second-row right, down the page. A copy of the images showing the assigned designators has been provided to the Natural History Museum, for placement with the folio. These designators are suggested for use in specimen citation, to replace the use of page numbers or other accompanying numbers seen on many labels, as resorted to by other authors. The designators are employed in the present discussion where appropriate.

Nearly all specimens are accompanied by a small label. (A very few have no label; a few have either two labels, or a label clearly belonging with another specimen.) The labels vary in proportion and dimension, but are mostly of horizontal rectangles, 5 to 8 cm long, 2 to 5 cm high. All have clearly been individually and somewhat roughly cut from other sheets. A few (e.g., 41-E, 51-A, 65-A, 71-A, 80-A, 83-A, 83-E) have been folded transversely, the lower half tucked behind the upper half which bears the writing. Two distinct paper stocks were used for the labels, both of "laid paper," formed from a linen slurry: the one thin, tan, with laid-lines spaced ±9 per cm; the other heavier, whiter, with laid-lines ±7 per cm.

Most of the specimens are attached to the label by one slit or more often two parallel

slits cut in the label, with the plant stem passed under the resulting strap. At times the slits are in the form of shallow V's (e.g., spms. 24-B, 31-C, 32-C, 34-B, 61a-F), indicating they were cut by folding the label, then making the two cuts with two snips of a scissors. Frequently part of the writing on the slip is beneath part of the specimen, obviously having been inscribed prior to attachment of the plant. A few of the specimens have been attached to the label by slender pins (e.g., 46-B, 60-F, 61a-A, 92-J, 105-C). Others have been given firmer mounting, either to the label or to the underlying sheet, by conventional narrow tape strips.

A significant achievement of the Project has been the determination of nearly all of the handwritings on the labels. Yet, for reasons explained elsewhere (Ward, in press), this information is of less value than might be assumed for determination of the collector of the accompanying specimen or for prediction of its use by Thomas Walter in forming the

diagnoses of his Flora.

Two handwritings predominate on the labels: Thomas Walter (ca. 1740–1789), and John Fraser (1750–1811). The hand of Fraser's son, John Fraser (1780–1861) [not "1799–1860?"—Fernald & Schubert 1948] also appears to be present, though rarely. External evidence of these hands is provided by a 158-word letter written by Walter in 1783 and reproduced by Ewan (1979), and by a 48-word letter written by Fraser's son in 1818 in the Autograph Collection of the Natural History Museum. Fraser's hand is established by the few words and dates of the title page and by occasional brief, initialed notes accompanying the specimens (e.g., 67-A, 78-E). The third hand probably of Fraser fil. differs markedly from that of Fraser and also somewhat from that of Walter. It is found on a few labels (e.g., 8-C, 12-F, 27-D, 38-J, 46-C, 61b-D, 105-C, 115-G). Numbering of the pages of the folio may also have been by Fraser fil.; these numbers are not in the hand of Fraser sr.

Once determination was made that two writers were responsible for the great majority of the labels, most of the handwriting could be assigned. Past authors have referred in general terms to similarities with that of Walter, Fraser, or Fraser's son, but few authors have claimed which hands were found in association with specific specimens, and none are known to have based nomenclatural arguments on such identifications. [Blake (1915:130) correctly identified Walter's hand on four labels, but wrongly concluded "most of the remaining labels are in another hand, which from its agreement with some writing on the title page of the volume may be affirmed with considerable certainty to be that of John Fraser himself.] Yet close—and tediously prolonged—examination of the handwriting of the labels and of the available handwriting samples does usually permit certain identification.

John Fraser's hand in most cases is unambiguous. It is a smoothly flowing script, with the letters consistently formed and widely spaced. His capital "A" is of the classic "inverted V" and uniformly shows the cross-bar sweeping far left across the ascent. His capital "C" is always shaped with both its beginning and terminus well to the left of the figure. His capital "P" is initiated by a strong upstroke, sharply reversed to a downstroke, again reversed to form a clockwise loop. Many of his other capital letters also show distinctive features, though his lower case letters are largely of standard form. He is unfailing in his practice of using capitals for the initial letters of both genera and epithets. His hand is of an extrovert—if this term can be applied to a writing style—fitting the man of confidence and courage his travels and ventures show him to have been.

Thomas Walter's hand is far more cautious, cramped, and poorly, unevenly formed. His capital "A" is at times an "inverted V," but his cross-bar is formed separately and

scarcely touches the ascent; for many of his plant names his capital "A" is merely lower case writ large. His capital "C" is of the same form as Fraser's, but only the beginning is from the left; the lower terminus invariably links with the next letter. His capital "P" is of a smooth clockwise swirl, with the initial stroke directed downward. With few exceptions his epithets are not capitalized. His hand in general is that of a busy, quick thinking person, not overly concerned with the niceties of precise letter formation; in modern days his script might have been that of a doctor.

A readily available sample of the two handwritings is given in photographs shown by Faden (1989:46–47). There, the single word "Commelina" is written on the label of a specimen of *C. erecta* by Walter, and on the label of a specimen of *C. caroliniana* by Fraser. The Walter label also bears "305," a number written by Fraser.

John Fraser fil.'s hand is poorly understood because of its infrequent appearance. Though it is unlikely to be mistaken for that of John Fraser sr., brief sequences of letters (as in plant names or brief notes) may not show marked contrast with that of Walter. A character that may be useful is the "square r" here attributed to Fraser fil., while the lowercase "r" of both Fraser sr. and Walter is usually an abrupt simple upward pip.

More than half of the labels (371, or 54%) bear three-digit (rarely two-digit) numbers in a darker ink and a coarser pen, and seem to have been written prior to other markings. The hand forming these numbers is that of John Fraser; his distinctively malformed "8" appears also as part of the date given on the title page of the folio. (Representative specimens so marked: 1-H, 27-C, 34-D, 51-B, 54-D, 59-E, 66-C, 101-C, 103-F, 107-A.) Britten (1921) was unable to discover the use to which Fraser put these numbers, nor have others suggested any logical purpose. The numbers correspond neither to the present arrangement of the specimens nor to the sequence of Walter's Flora (nor presumably to its parent manuscript). Many of these numbers have been struck by a single diagonal slash; most of the rest are accompanied by a small checkmark. No numbers are repeated. The numbers may differ in size between two adjacent specimens (e.g., 62a-B and 62a-C, 94-D and 94-E), demonstrating that specimens now adjacent in the herbarium were numbered at different times. Frequently the numbers are partially cut away at edge of the label (e.g., 38-I, 50-E, 80-D, 84-A, 86-C, 92-A, 105-B, 108-F). These characteristics support the speculation that Fraser's numbers served as field references, perhaps coupled to a now-lost separate record of source and date, the pages later cut to their present dimensions and used as permanent labels. The few two-digit numbers of this series (six exceptions, but not clearly in the same hand), together with knowledge that Fraser spent earlier years (1780-1784) in Newfoundland where he also studied plants (Fraser 1789; Hogg 1852), suggests that these numbers may have been a continuing enumeration of his collections begun before he first came to the Carolinas. Certainly, aside from their initial purpose, their presence on the label indicates that the specimen is of Fraser's collection, whether or not it was later seen by Thomas Walter.

Another series of numbers seems not to have been noted. Each number of this small class (20 numbers) is preceded by a capital "F" or "FC." All are clear references to the numbered genera in *Flora Caroliniana*. Examples: 100-C is named "*Staphylea Trifolia*" and numbered "F 132," while genus 132 is *Staphylea*; 106-A is named "*Verbena Urticifolia*" and numbered "F 236," while genus 236 is *Verbena* with the single species *V. urticifolia*; 116-C and 116-D both bear the name "*Syntherisma*" and are numbered "F 35," while genus 35 is *Syntherisma* (= *Digitaria*). (Further examples: 32-A, 32-B, 32-C, 32-D, 38-J, 48-C, 115-G, 117-A, 117-D, 117-E.) Most of the numbers occur in clusters (e.g., 32-A thru 32-D, 101-A

thru 101-G, 115-G thru 117-E), indicating they were assigned after the specimens were arranged in the herbarium. The hand inscribing this series of numbers is probably that of Fraser (e.g., 38-J, 48-C, 100-C), though at times the "F" seems unlike his. Possibly it is that of his son; it is not that of Walter. These numbers were certainly assigned after publication of *Flora Caroliniana*, or at least after access to the completed manuscript. This second series of numbers appears to have been a partial, never completed attempt to match the specimens collected by Fraser to the appropriate genus as numbered by Walter.

Within the folio the specimens are arranged in an alphabetical sequence, as determined by the names borne by the original labels. These names, in turn, are largely those used in Walter's Flora Caroliniana (1788). [The few exceptions are usually in the hand of John Fraser and bear a name from Linnaeus that was not used by Walter (e.g., 37-G, "Cornus canadensis"; 52-E, "Globularia nudicaulis"; 58-C, "Helonias bullata"), or a comment by Fraser or Walter in place of a name [e.g., 38-D, "Corypha arborea" (= Sabal palmetto); 43-B, "Erythronium Dens Canis" (= E. americanum); 55-C, "Hedysarum Flore magnus" (= Desmodium cuspidatum); 67-D, "Lupinus affinis" (= Crotalaria rotundifolia); 72-A, "Mespilus Large Cock Spur" (= Crataegus crus-galli); 98-D, "Smilax Baccis albidis" (= Smilax laurifolia)].

Of the specimens bearing an identification on the label (either complete, or only to genus), 345 (50.1%) bear Walter's hand, 230 (33.4%) bear Fraser's. Often the hands of Walter and of Fraser are found on the same label. On 49 labels Walter identified the specimen to genus and Fraser completed the naming by adding the species. On none of the labels did Fraser identify the specimen to genus, with Walter adding the species.

Handwritings by other persons have been added over the years, usually in the form of identifications. They may be on separate slips, on the adjacent sheet, or on the original label itself. Those writers identified on the frontispiece of the folio (by James Britten) are: Oakes Ames, Sidney F. Blake, Nathaniel Lord Britton, Alva A. Eaton, Asa Gray, Albert S. Hitchcock, Charles S. Sargent, James E. Smith, and Anna M. Vail. Others include James Britten, James E. Dandy, Merritt Lyndon Fernald, William T. Gillis, A. J. Kosterman, John Lewis, Mildred E. Mathias, and Charles A. Weatherby. More recent annotations (since 1983) are by Joseph Ewan, David K. Northington, David H. Rembert, Daniel B. Ward, and others.

Identification of the specimens is no easy task. As noted in 1839 by Asa Gray (J.L. Gray 1893), many of the specimens are "mere bits," small vegetative fragments, single leaves or single flowers, often wholly unidentifiable from photographs and scarcely less so by direct examination without painstaking comparison to known materials. Significant efforts to identify more than single genera by direct examination are few. Hitchcock (1905) reviewed Walter's grasses and matched many of their names with Fraser's specimens. Blake (1915) discussed 22 Walter names and their corresponding specimens and made new combinations where indicated. Fernald & Schubert (1948), working from photographs, identified—not always correctly—19 specimens in the herbarium. Others have examined the species of individual genera and published their conclusions. Still others, notably Oakes Ames with the orchids, and Asa Gray and David H. Rembert with large parts of the entire herbarium, have given significant time to identifying the specimens, but have left no record other than their annotations and notes.

At the present writing perhaps one third of the specimens has been given a creditable identification, one third a tentative judgment, and one third no more than a cautious assignment of genus. Complete identifications must await opportunity for study by persons who have simultaneous access to the Fraser specimens and to a convenient reference collection.

Only two of the 690 specimens bear a date on the original label. Spm. 78-E, probably *Platanthera flava*, is atypically instructive: "Orchis / found near the / Table Mountains / 11th June / 1787 / JF." The hand, confirmed by the initials, is that of John Fraser. Spm. 100-F, *Gillenia trifoliata*, is briefly informative though lacking the year of collection: "16 June / Indian Emetic," written by Fraser, followed by "Spiraea trifoliata," written by Walter.

Equally few specimens bear a geographic source on the original label. Only two labels give locations; both are in Fraser's hand. As noted, spm. 78-E, probably *Platanthera flava*, was collected near the "Table Mountains," perhaps Table Rock, Pickens Co., South Carolina (less likely: Table Rock, Burke Co., North Carolina). Spm. 67-A, *Lupinus villosus*, was labeled "Blue Flowering / Lupinus / Pilosus / Found on y\e / Border of y\e / Altamayhaw / J.F." This of course is the Altamaha River, which flows through southeastern Georgia. The first of these locations is about 360 km northwest of Fraser's base in Charleston; the second is about 240 km to the south. The distance between these locations, together with the certainty that these summer-flowering species must both have been collected in 1787, is a measure of John Fraser's energy and dedication.

Most of the specimens (624, or 91%) are labeled with an identification—a genus and species, or a genus only. 328 (48%) of the specimens are fully identified (to genus and species), by either Walter or Fraser or by both (where Walter wrote the genus and Fraser added the epithet). Nearly half of the specimens (296, or 43%) are identified only to genus, 183 of them (27%) by Walter, 113 (16%) by Fraser. 64 (9%) of the specimens bear labels, but were not identified.

The labels of occasional specimens carry comments or information other than the identification. Walter frequently appeared not to recognize the plant, but wrote a brief Latin diagnosis which reflects his familiarity with Linnaeus' sexual system of classification. Some examples: 4-C, Ptilimnium capillaceum—"Ammi majus sp. nova?"; 55-C, Desmodium cuspidatum—"Hedysarum Flore magnus"; 60-F, Silene stellata—"ignota"; 61b-B, Iva imbricata—"Iva ? nova"; 67-D, Crotalaria rotundifolia—"Lupinus affinis"; 75-F, Nelumbo lutea—"The Great Nymphaea"; 86-B, Myriophyllum pinnatum—"Potamogeton monoicum"; 87-D, Physostegia virginiana—"Prasium nov"; 89-A, Cynanchum angustifolium—"Pentand[ria] Digyn[ia] bifollic"; 90-B, Quercus michauxii—"Quercus nova"; 91-A, Brunnichia ovata—"Rajania (monoica)"; 97-C, Bumelia lanuginosa—"fol. angustis obovatis integris subtus tomentosus"; 98-D, Smilax laurifolia—"Smilax Baccis albidis"; 106-E, Phyla nodiflora—"Verbena nodiflora Didynamia gymnosperm disperma"; 108-D, Viola villosa—"Viola Fol. pubescent"; 114-E, Juncus effusus—"an Juncus"; 117-A, Decodon verticillatus—"Decand monogyn nov G. aquatic"; 117-B, Cynoctonum sessilifolium—"Genus nov Pentand digyn."

Fraser's distinctive script usually appears to be of observations made of the plants in the field. When he ventures into Latin he is clearly in unfamiliar country. Britten (1921) gently noted Fraser's limited linguistic skill where "nova genera" was used "as a singular," trusting his classic-trained readers to understand. Some of Fraser's notations: 1-D, *Viburnum dentatum*—"not in y\e Flora"; 11-B, *Asclepias* sp.—"Dove Coloured"; 12-G, *Aster concolor*—"Aster Dark Blue Flower"; 22-C, *Psoralea canescens*—"Buchnera americana native name Buck root"; 38-G, *Croton punctatus*—"Croton Maritimum Nova"; 52-I, (unidentified)—"Granadilla not in y\e flora"; 62a-A, *Aesculus parviflora*—"Juglans Alba nova"; 67-A, *Lupinus villosus*—"Blue Flowering Lupinus Pilosus Found on y\e Border of y\e Altamayhaw J.F."; 67-C, *Lupinus perennis*—"Lupinus Perrenis [sic]"; 72-A, *Crataegus crusgalli*—"Mespilus Large Cock Spur"; 72-B, *Crataegus uniflora*—"Mespilus Small Cock Spur";

92-K, Rhododendron minus-"Leaves like y\e Kalmia? Latifolia grows on y\e Mountain in decid. y\e Est\n & Wes\n Waters"; 93-C, Salix humilis-"Salix Minor? of Fraser"; 100-K, Arenaria uniflora-"No Name"; 106-F, Verbena tenuisecta-"Nova Genera"; 108-C, Viola primulifolia-"Viola White Flowers Downy Leaf"; 110-A, Vitis labruska-"Vitis? Labruska Fox Grape"; 116-B, Eriogonum tomentosum-"Sophoranthus nov genera"; 117-C, Lachnanthes caroliniana-"Nova Genera"; 117-E, Carphephorus sp.-"Genera Nova."

Comments on a few labels are not in Fraser's hand nor in Walter's, and show involvement of a third person: 8-C, *Stylosanthes biflora*—"Arachis ground nut"; 12-F, *Aster* sp.—"Aster grows 16 feet high"; 46-C, *Conoclinium coelestinum*—"Bright violet blue: said to be a specific for the venereal complaint"; 105-C, *Vaccinium arboreum*—"A Vaccinium 5 miles from Cranberry measured 50 feet high"; 115-G, *Planera aquatica*—"Monoecia Triandria G. nova."

The handwriting on these last-cited labels, and a few others, poses a puzzling, unresolved question. The content of most suggests they were written at the time of collection. Their subject matter is wholly different from the technical comments recorded by Walter. And the hand is quite incongruous with that of Fraser sr. The "square r" of some (8-C, 12-F, 27-D, 38-J, 46-C, 105-C) would seem to be that of Fraser fil. Yet John Fraser, the son, did not accompany his father to the Americas until 1800 (Hogg 1852), more than a decade after Fraser's 1786–1788 trip, and eleven years after Walter's death. Could these notations have been made by Fraser fil. on his father's labels after they were brought to England? Or is it possible these specimens (and perhaps others) were obtained, and annotated, by Fraser fil. on his 1800 trip to the Americas with his father?

The labeling of one species confirms an involvement of a third person in identification and possibly a fourth in mounting of the specimens. A mint, *Trichostema dichotomum*, is represented by two collections, 61b-D and 103-F. Both are labeled with its name. The label of 103-F is in Walter's hand, and is spelled conventionally. But 61b-D is in another hand, neither Walter's nor Fraser's. The style of the capital "T" is so different that the mounter of the specimens, intending to arrange them in alphabetical order (as was done with 103-F), but seemingly misreading the convoluted script of the initial letter, has placed 61b-D between "Iva" and "Illicium." Further, the writer of that label transcribed its epithet as "dichotoma," suggesting one of sufficient education to perceive an apparent error of gender mismatch between epithet and genus, yet without adequate classic background to understand that "-stema" is a neuter root. Even more, the mounter himself must have been of limited experience not to have recognized the distinctive specimen as one already found elsewhere in the folio. With certainty, Fraser sr. neither formed this label nor was involved in its mounting.

One specimen is wholly aberrant. Spm. 102-A is a branched structure mounted alone on a full page. It is a gorgonian (Gorgoniidae-coral, s.l.). Enlarged bodies on its branches are barnacles (Archaeobalanidae; *Conopea* sp.). It was labeled "Sea Plant" in Fraser's hand.

The physical processing of the specimens into the present folio remains poorly understood. Walter, of course, was not involved. Fraser, perhaps soon after his return to England in March 1788, must have acquired the empty folio and, as indicated by his writing on the title page, established its goal. It is often forgotten that the present herbarium of 690 plants is only a subset of the "upwards of thirty thousand dried specimens of plants" Fraser (1789) claimed to have gathered during his 1786–1788 trip to the Americas. An unknown number, perhaps the greater part, were sold by Fraser (1789) to Charles Louis L'Heritier, a wealthy French botanist, and are now in the Lamarck herbarium, Paris. The

basis is unknown by which Fraser, or his sons during his absence on later trips to the Americas, Cuba, and Russia (Hogg 1852; Simpson et al. 1997), selected from this larger collection the plants to be retained in the "Walter Herbarium."

The historic importance of this early sampling of the plants of Georgia and the Carolinas is unquestioned. America is fortunate the fates have preserved this fragmentary glimpse of its vegetation as it appeared before the full impact of modern civilization. Even so, the larger value of the John Fraser folio and the specimens it contains lies in the degree it supports the writing of Thomas Walter and his *Flora Caroliniana*. The nomenclatural basis for Walter's work and its relation to Fraser's herbarium is to be discussed in subsequent reports of the Thomas Walter Typification Project.

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